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Colour Variation of Plant Latex

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Abstract: ***This paper has focused on the possible reasons in the variation of latex colour. The type of latex colour that the plants generally exhibit. The paper has also urged for further investigations needed in this field.***

Keywords: Latex, Colour, Family, Aposematic

Specialized cells known as laticifers are present in some of the plants. As a defense mechanism these cells ooze out latex on any kind of scratch or wound caused to the plants. In the plant kingdom around 40 families and 20, 000 species possess laticifers (Agrawal and Konno 2009). Latex exudates physically seal the wounds and further protect the plants from getting infected (Fahn A.1979) (Konno 2011). In majority of the cases latex appear white, while in some plant's colors like yellow, orange and red have been observed. Completely transparent latex i. e., without any particular colour has been noticed in some of the plants like *Nerium oleander* L. of the Apocynaceae family (Konno 2011). Plants like *Calotropis procera* (Aiton) W. T. Aiton (Apocynaceae), *Asclepias syriaca* L. (Apocynaceae), *Cascabela thevetia* (L.) Lippold (Apocynaceae), plants of genus *Euphorbia* L. (Euphorbiaceae), *Ficus carica* L. (Moraceae), *Ficus elastica* (Moraceae), *Hevea brasiliensis* (Euphorbiaceae), *Papaver somniferum* L. (Papaveraceae) etc., yield white coloured latex (Konno 2011) (Mithöfer 2012). Yellow - orange but transparent latex is found in *Chelidonium majus* L. (Papaveraceae). Yellow coloured latex is also acquired from *Argemone Mexicana* L. (Papaveraceae) (Abdualdaim Mohammed Mukred 2014). In *Ficus septica* Burm. f. (Moraceae) pale yellow non - transparent latex is observed while in *Ficus benguetensis* Elmer Drew Merrill orange - colored non - transparent latex exudes is seen (Konno 2011). In *Croton lechleri*, *Cannabis* spp. (Cannabaceae), *Dracaena* spp. (Asparagaceae), Pterocarpus spp., red coloured latex is observed (Konno 2011).

Theere is no inherent reason for the production of only white colour latex. Some proposed theory exist for the this particular coloration of the latex. Agrawal and Konno (2009), stated that the rubber particles dispersed in the latex is the main reason for the white coloration. In various plant lineages independent evolution of white latex has been observed (Hagel 2008). Since white is a dominant colour there should have been a strong selection for this particular colour (Lev - Yadun 2014). In Another theory by Lev - Yadun. S. (2014), it was proposed that latex is principally white in colour as it gets high visibility under distinct light conditions. On the green leaves, dark grey - brown barks, tender stems and unripe fruits, the white latex can get easily visible. The white colour serves as a visual aposematic indication about the defensive qualities of the plants bearing them. Even the colour - blind animals can also see the contrasting colour easily in the dark background of the forests. The yellow, orange and the red colour of the latex produce visual aposematic (warning) effects. Visual advertisement of these colors saves the plant from other organisms (Lev - Yadun 2001) (Lev - Yadun 2009) (Schaefer and Ruxton 2011).

Plant Latex is a rich source of several biologically active compounds (Das et al.1967). We propose that due to the presence of certain component (s) the pigmentation of latex varies accordingly. The colour of flowers are because of the presence of pigment anthocyanins, in similar manner there may be some pigment molecule present in the laticifer cells due to which latex acquires a particular colour. Further research works are highly essential for finding the exact reason (s) of the typical coloration of latex a plant yield.

References

[1] M. M. Abdualdaim, "The fresh Yellow Latex of *Argemone mexicana* Linn. used as antibacterial of wound", International Journal of Science and Research. Vol.3, No.3, pp.727 - 729, 2014.
[2] A. A. Agrawal, K. Konno, "Latex: a model for understanding mechanisms, ecology, and evolution of plant defense against herbivory", Annual Review of Ecology, Evolution and Systematics. Vol.40, No.1, pp.311 - 331, 2009.
[3] A. Das, A. K. Dutta, S. Razzaque, B. Saha, P. S. Gope, N. Choudhury, "Analgesic and Antidiarrheal Properties of the Latex of *Calotropis Procera*", International Journal of Pharmaceutical & Biological Archives. Vol.2, No.1, pp.521 - 525, 2011.
[4] A. Fahn (1979). Secretory tissues in plants. Academic Press, New York, London, pp 242.
[5] J. M. Hagel, E. C. Yeung, P. J. Facchini, "Got milk? The secret life of laticifers, " Trends in Plant Science. Vol.13, No.10, pp.631–639, 2008.
[6] K. Konno, "Plant latex and other exudates as plant defense systems: roles of various defense chemicals and proteins contained therein", Phytochemistry. Vol.72, No.13, pp.1510–1530, 2011.
[7] S. Lev - Yadun, "Aposematic (warning) coloration associated with thorns in higher plants", Journal of Theoretical Biology. Vol.210, No.3, pp.385–388, 2001.
[8] S. Lev - Yadun (2009). Aposematic (warning) coloration in plants. In: Baluska F (ed) Plant -

environment interactions. From sensory plant biology to active plant behavior. Springer, Berlin, pp 167–202.
[9] S. Lev - Yadun, "Why is latex usually white and only sometimes yellow, orange or red? Simultaneous visual and chemical plant defense", Chemoecology. Vol.24, No.5, pp.215 - 218, 2014.
[10] A. Mithöfer, W. Boland, "Plant defense against herbivores: chemical aspects", Annual Review of Plant Biology. Vol.63, No.1, pp.431 - 450, 2012.
[11] H. M. Schaefer, G. D. Ruxton (2011). Plant - animal communication. Oxford University Press, New York.